MARIE

April 2003 Status – Science Data Comments

The MARIE instrument is continuing to perform as expected and providing science data as anticipated.

During April 2003, the MARIE instrument provided radiation data from 1st through the 30th with few intermittent breaks due to data down load and erase sequence. In the month of April, the MARIE instrument was in science mode, acquiring data, about 91% of the time, corresponding to 27.3 days.

Radiation dose-rate measurements from MARIE data during the period from April 1st through 30th indicate that the background GCR dose-rate was 21 ± 2 mrad/day, within 10% of the model calculations. For the month of April, the predicted model estimate of *quiet-time* GCR was 21.91 mrad/day while the MARIE measured April monthly average being 21.36 mrad/day. Thus, the MARIE measurements are within 2.5% of the predicted model calculations, however, uncertainties in the data are anticipated to be ± 5%. The data from the month of April consists of the *quiet-time* GCR and there is no indication of any SPE. The average Earth-Sun-Mars angle during April was about 49.20° with Earth at 1.00 AU and Mars at 1.49 AU

MARIE Recent Observations: From early November 2002 through mid-March 2003, there were no SPE enhanced dose-rate was observed. This is the longest period without an SPE since March 2002 in the Odyssey mapping phase. A particularly interesting SPE was observed on March 18-19, 2003; analysis of that data has been a top priority of the science team. April 2003 data consists of *quiet time* GCR measurements only.

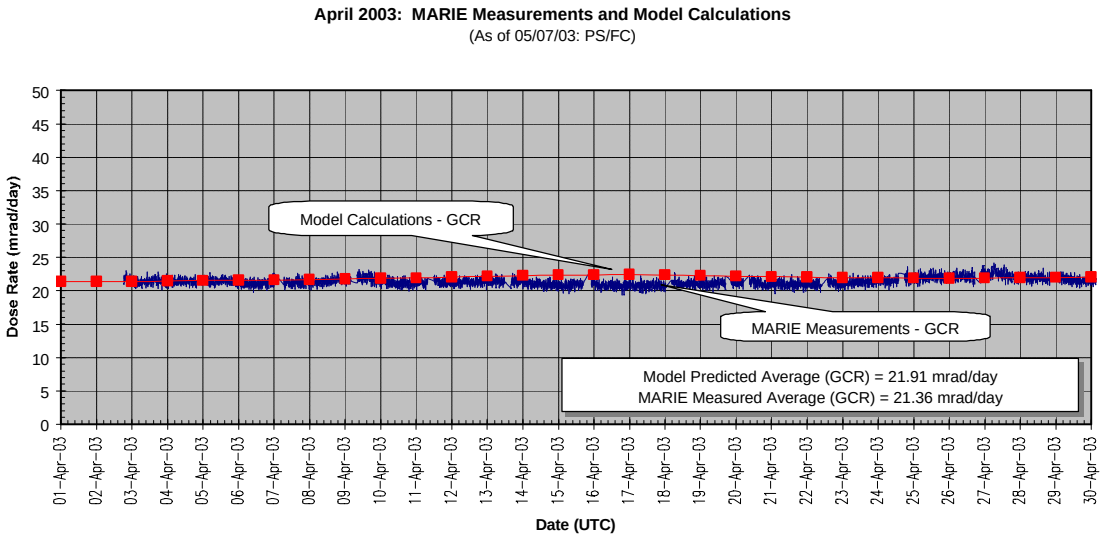

Figure-1: Radiation dose-rate from the GCR contribution in the Martian orbit during April 2003. Dose-rate (mrad/day) measurements from the MARIE instrument (blue discrete line) are shown along with the HZETRN model predictions (red dotted line). Average dose-rate is within 2.5% of the model predictions. Also, see Figure-3.

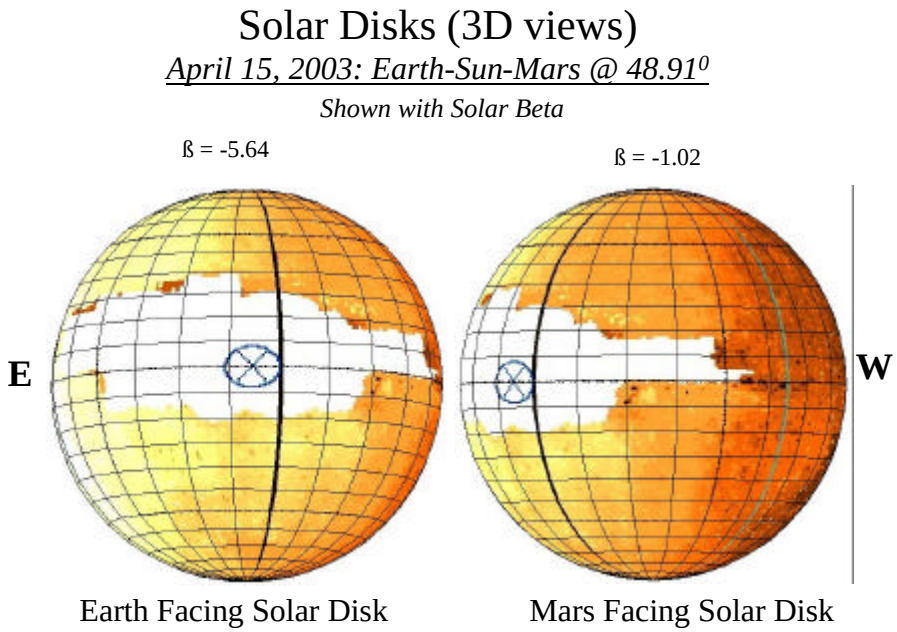

Figure-2: Solar disks on April 15, 2003. Both the Earth facing (on the left) and the Mars facing (on the right) are shown in 3D. There are no known active regions indicative of probable SPE are marked on these solar disks.

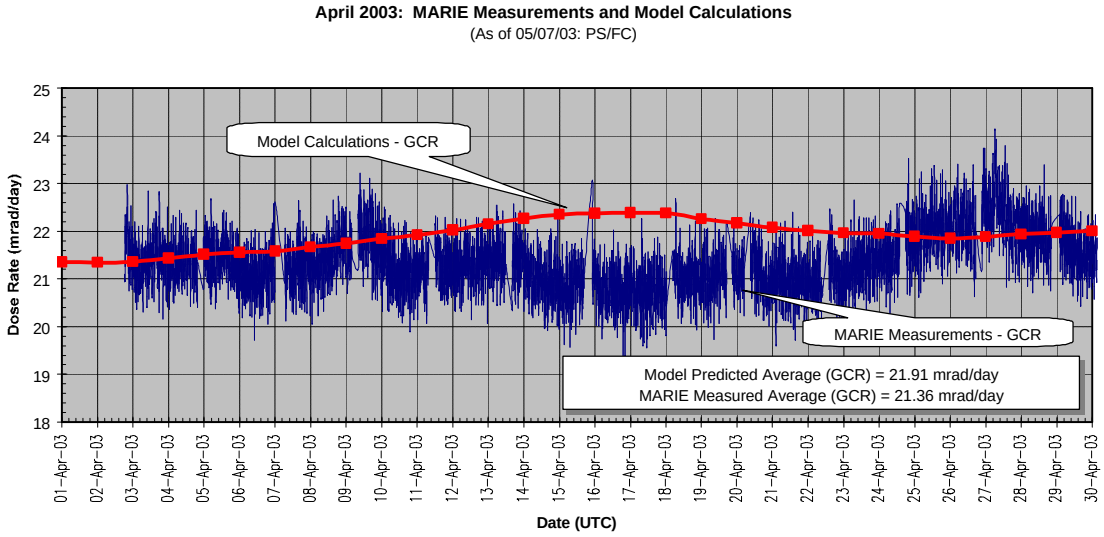

Figure-3 (Close-up view of Figure-1): Radiation dose-rate from the GCR contribution in the Martian orbit during April 2003. Dose-rate (mrad/day) measurements from the MARIE instrument (blue discrete line) are shown along with the HZETRN model predictions (red dotted line). Average dose-rate is within 2.5% of the model predictions.